AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (cancelled)

2. (cancelled)

3. (cancelled)

4. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion; and

an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion, wherein the elastomeric lip comprises a base secured to the faceplate portion and an end displaceably abutting against the outward sleeve portion.

5. (previously presented) The seal of claim 4, wherein the end of the elastomeric lip is oriented generally radially inward.

6. (previously presented) The seal of claim 4, wherein the end of the elastomeric lip is oriented generally axially outward.

7. (previously presented) The seal of claim 4, wherein the end of the elastomeric lip is oriented generally both axially outward and radially inward.

8. (previously presented) The seal of claim 4, further comprising a second elastomeric lip that includes a base secured to the faceplate portion and an end displaceably abutting against the outward sleeve portion.

9. (previously presented) The seal of claim 8, wherein the ends of the elastomeric lips are oriented generally radially inward.

10. (cancelled)

11. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion; and

wherein the faceplate portion comprises a parallel portion that is generally parallel to the longitudinal axis of the shaft.

12. (previously presented) The seal of claim 11, wherein the faceplate portion further comprises a portion generally parallel to the faceplate portion and extending radially from the parallel portion of the faceplate.

13. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion; and

a second elastomeric lip extending generally between the flange sleeve portion and the outer housing.

14. (previously presented) The seal of claim 13, wherein the second elastomeric lip comprises a base secured to the flange sleeve portion and an end displaceably abutting against the outer housing.

15. (currently amended) ~~The seal of claim 3,~~ A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion; and

a second elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

16. (previously presented) The seal of claim 15, further comprising a garter spring associated with the second elastomeric lip, which is a main sealing lip.

17. (previously presented) The seal of claim 15, further comprising a third elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

18. (previously presented) The seal of claim 17, further comprising a fourth elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

19. (previously presented) The seal of claim 18, further comprising a fifth elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

20. (previously presented) The seal of claim 17, further comprising an elastomeric bumper attached to the housing portion and abutting against the flange sleeve portion.

21. (previously presented) The seal of claim 15, further comprising third and fourth elastomeric lips that each include a base secured to the flange housing portion and an end displaceably abutting against the sleeve, wherein the second, third and fourth elastomeric lips are all oriented generally axially inward.

22. (previously presented) The seal of claim 21, further comprising an elastomeric bumper attached to the outer housing and abutting against the flange sleeve portion.

23. (currently amended) ~~The seal of claim 2,~~ A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

wherein the sleeve is formed from at least two pieces, the first piece comprising the outward sleeve portion and the second piece comprising the inward sleeve portion.

24. (previously presented) The seal of claim 23, wherein the flange sleeve portion comprises a flange that extends generally radially outward from the outward sleeve portion.

25. (previously presented) The seal of claim 23, wherein the flange sleeve portion comprises a flange that extends generally radially outward from the inward sleeve portion.

26. (previously presented) The seal of claim 23, wherein the flange sleeve portion comprises two flanges, one extending generally radially outward from the inward sleeve portion and the other extending generally radially outward from the outward sleeve portion.

27. (currently amended) [[A]] A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion; and

an elastomeric lip extending generally between the flange sleeve portion and the outer housing.

28. (previously presented) The seal of claim 27, wherein the elastomeric lip comprises a base secured to the flange sleeve portion and an end displaceably abutting against the outer housing.

29. (previously presented) The seal of claim 28, wherein the end of the elastomeric lip is oriented generally radially outward.

30. (previously presented) The seal of claim 28, wherein the end of the elastomeric lip is oriented generally axially outward.

31. (previously presented) The seal of claim 28, wherein the end of the elastomeric lip is oriented generally both axially and radially outward.

32. (previously presented) The seal of claim 27, further comprising an elastomeric coating on at least a portion of the sleeve in a region between the sleeve and the shaft.

33. (previously presented) The seal of claim 32, wherein the elastomeric coating extends into at least a portion of a region between the outward and inward sleeve portions.

34. (previously presented) The seal of claim 32, wherein the elastomeric coating has a radial channel.

35. (previously presented) The seal of claim 27, further comprising a second elastomeric lip extending generally between the faceplate portion and the sleeve.

36. (previously presented) The seal of claim 35, wherein the second elastomeric lip comprises a base secured to the faceplate portion and an end displaceably abutting against the outward sleeve portion.

37. (previously presented) The seal of claim 27, further comprising a second elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

38. (previously presented) The seal of claim 37, further comprising a garter spring associated with the second elastomeric lip, which is a main sealing lip.

39. (previously presented) The seal of claim 37, further comprising a third elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

40. (previously presented) The seal of claim 39, further comprising a fourth elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

41. (previously presented) The seal of claim 40, further comprising a fifth elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the sleeve.

42. (previously presented) The seal of claim 39, further comprising an elastomeric bumper attached to the housing portion and abutting against the flange sleeve portion.

43. (previously presented) The seal of claim 37, further comprising third and fourth elastomeric lips that each include a base secured to the flange housing portion and an end displaceably abutting against the sleeve, wherein the second, third and fourth elastomeric lips are all oriented generally axially inward.

44. (previously presented) The seal of claim 43, further comprising an elastomeric bumper attached to the outer housing and abutting against the sleeve.

45. (previously presented) The seal of claim 27, further comprising a second parallel housing portion generally parallel to the longitudinal axis of the shaft.

46. (previously presented) The seal of claim 45, wherein the second parallel housing portion is attached to an inward end of the first parallel housing portion.

47. (cancelled)

48. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion; and

further comprising an elastomeric bumper attached to the housing portion and abutting against the flange sleeve portion, wherein the elastomeric bumper is also attached to the parallel housing portion.

49. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

further comprising an elastomeric bumper attached to the housing portion and abutting against the flange sleeve portion; and

wherein the sleeve is formed from at least two pieces, the first piece comprising the outward sleeve portion and the second piece comprising the inward sleeve portion, wherein the flange sleeve portion comprises at least one flange extending generally radially outward from the outward or inward sleeve portions, wherein the bumper abuts against said flange.

50-55. (cancelled)

56. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said

outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion;

a garter spring associated with the elastomeric lip, which is a main sealing lip;

a second elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion, wherein the second elastomeric lip extends generally axially outward from the flange housing portion;

a third elastomeric lip extending generally axially outward; and

further comprising a fourth elastomeric lip extending generally axially outward.

57. (cancelled)

58. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion, wherein the elastomeric lip extends generally axially inward from the flange housing portion; and

a second elastomeric lip that extends generally axially inward from the flange housing portion.

59. (previously presented) The seal of claim 58, further comprising a third elastomeric lip that extends generally inward from the flange housing portion.

60. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said

outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion; and

wherein the outer housing further comprises a second flange housing portion extending generally radially outward from the outer housing.

61. (cancelled)

62. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion; and

wherein the faceplate portion comprises a parallel portion that is generally parallel to the longitudinal axis of the shaft,

wherein the faceplate portion further comprises a portion generally parallel to the faceplate portion and extending radially from the parallel portion of the faceplate.

63. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion; and

an elastomeric lip extending generally between the flange sleeve portion and the outer housing.

64. (previously presented) A seal for sealing a rotary shaft, the seal comprising:

a sleeve adapted to be disposed generally coaxially around the shaft and comprising:

a flange sleeve portion extending generally radially outward from the sleeve;

an outward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially outward from the flange sleeve portion, said

outward sleeve portion including an endpoint defining an axially outermost point disposed in a first direction relative to said flange sleeve portion, and

an inward sleeve portion generally parallel to the longitudinal axis of the shaft and extending generally axially inward from the flange sleeve portion, said inward sleeve portion including an endpoint defining an axially innermost point disposed in a second direction relative to said flange sleeve portion opposite said first direction; and

an outer housing configured to generally surround the flange sleeve portion and at least a part of the outward and inward sleeve portions, the outer housing comprising

a flange housing portion extending generally radially inward from the outer housing and positioned axially inward relative to the flange sleeve portion,

a parallel housing portion generally parallel to the longitudinal axis of the shaft, and

a faceplate portion extending generally radially inward from the outer housing and positioned axially outward relative to the flange sleeve portion;

an elastomeric lip that includes a base secured to the flange housing portion and an end displaceably abutting against the inward sleeve portion; and

an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion.

65. (previously presented) The seal of claim 50, further comprising an elastomeric lip extending generally between the faceplate portion and the outward sleeve portion.